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RECENT TRENDS AND SEASONALITY IN ALFALFA MEAL
PRODUCTION, USE AND PRICES

by Jack S. Ross*

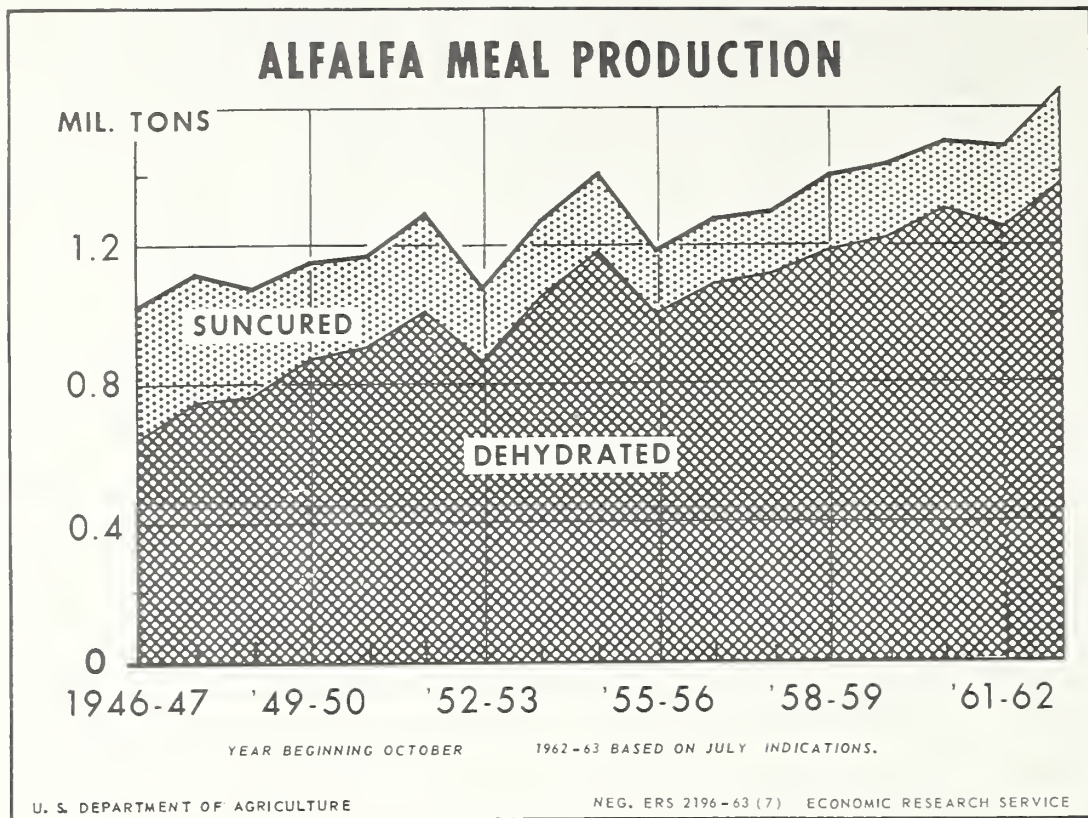
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: In 60 A. D., Columella said: "But of all the legumes,
: alfalfa is the best, because, when once it is sown it lasts 10
: years; because it can be mowed four times, and even six times,
: a year; because it improves the soil; because all lean cattle
: grow fat by feeding upon it; because it is a remedy for sick
: beasts; because a jugerum (two-thirds of an acre) will feed 3
: horses plentifully for a year." 1/
:

Alfalfa meal production in the U. S. generally has trended upward since its introduction as a new feed item in the early 1900's. In the beginning, meal was processed only from suncured alfalfa but, in 1910, the first dehydration system was developed with construction of a plant in Louisiana. Dehydrated alfalfa meal, however, did not advance to a commercial basis until the 1930's. In 1931, the first plant west of the Mississippi River, producing dehydrated meal on a commercial level, was located in Kansas. Through 1944-45, production totaled less than a million tons annually. But, in 1945-46, annual production increased sharply and has exceeded a million tons each year since. Alfalfa meal production has continued its upward trend in recent years and, in the current October-September feeding year, will probably exceed 1,600,000 tons for the first time.

The expanded demand for alfalfa meal has been due largely to its use as a vitamin supplement in poultry rations. Alfalfa meal contains a yellow-colored compound (xanthophyll), which imparts the desired yellow coloring to poultry flesh and egg yolks. Sold with a guaranteed protein of up to 20 percent, it generally contains added units of vitamin A. Basically, alfalfa meal can be described as a roughage feed ingredient which can be utilized in varying quantities by all classes of livestock and poultry. Its relatively high fiber content, however, limits the quantity that can be used in poultry rations. Alfalfa meal is marketed in a number of processed forms including meal, granules, pellets, and reground pellets. For ease of handling, most meal is exported in bulk as pellets.

1/ Crops in Peace and War, Yearbook of Agriculture, 1950-51, USDA, page 366.

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Dehydrated and Suncured Alfalfa Meal Production

In the past 2 decades, annual production of dehydrated alfalfa meal has trended upward rather sharply from the 317,000 tons produced in 1943-44 (year beginning October) to 1,259,000 in 1961-62. In the past 5 years, dehydrated alfalfa meal output has accounted for about 85 percent of total alfalfa meal produced. Production of dehydrated meal during October-June totaled 678,000 tons compared with 579,000 in that period a year earlier. If output is maintained at the current pace, production of dehydrated meal for the 1962-63 feeding year would total around 1,400,000 tons.

Prior to World War II most of the alfalfa meal produced in this country was from suncured alfalfa. Since 1945, annual production of meal from suncured alfalfa has trended downward from 675,000 tons to an average of about 200,000 in the past 7 to 8 years. During 1961-62, annual production of suncured alfalfa meal totaled 231,000 tons--the highest output since 1951-52. In the current feeding year, production may reach 260,000 tons, or 13 percent more than the output in 1961-62.

Consumption of Alfalfa Meal

Alfalfa meal is used almost entirely as an ingredient in livestock and poultry feeds. Disappearance has followed closely the upward trend in production.

Table 23.- Alfalfa meal: Production of dehydrated, suncured and total, United States, by months, 1950-62

Year begin- ning Oct.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Dehydrated													
1950	92	21	15	20	20	32	23	74	158	179	151	119	904
1951	67	17	8	4	16	22	32	115	203	210	178	134	1,006
1952	79	17	11	11	16	24	21	71	191	167	141	113	862
1953	71	19	9	5	12	20	36	131	211	203	159	170	1,046
1954	90	29	9	4	9	17	33	153	244	255	202	133	1,178
1955	104	23	5	7	6	12	19	104	217	207	176	120	1,000
1956	77	13	3	4	6	14	21	119	224	243	207	156	1,087
1957	108	18	5	4	2	10	16	129	228	204	228	164	1,116
1958	98	12	5	5	5	16	27	124	256	249	220	168	1,185
1959	88	16	4	4	4	14	25	158	241	266	227	173	1,220
1960	95	14	6	4	8	19	32	123	276	274	265	186	1,302
1961 1/	86	13	7	5	4	13	25	175	251	246	261	173	1,259
1962 1/	119	22	7	6	2	16	31	203	272				
Suncured													
1950	19	22	21	32	26	24	13	16	18	28	23	19	261
1951	28	33	31	36	22	18	15	15	19	23	22	18	280
1952	23	19	17	18	15	12	11	13	16	20	18	26	208
1953	18	17	19	20	15	19	17	15	19	21	20	19	219
1954	21	22	26	20	17	19	15	14	19	18	19	14	224
1955	13	16	17	16	15	15	12	14	15	16	16	16	181
1956	19	21	19	17	15	14	13	12	13	14	15	14	186
1957	15	16	18	16	14	16	14	13	14	13	16	14	179
1958	17	18	22	23	21	20	15	14	14	16	17	18	215
1959	18	24	25	19	18	15	15	14	15	16	17	17	213
1960	16	23	23	17	16	16	14	13	13	13	14	16	194
1961 1/	17	17	18	20	18	20	17	16	17	23	25	23	231
1962 1/	27	31	30	31	28	22	18	15	16				
Total													
1950	111	43	36	52	46	56	36	90	176	207	174	138	1,165
1951	95	50	39	40	38	40	47	130	222	233	200	152	1,286
1952	102	36	28	29	31	36	32	84	207	187	159	139	1,070
1953	89	36	28	25	27	39	53	146	230	224	179	189	1,265
1954	111	51	35	24	26	36	48	167	263	273	221	147	1,402
1955	117	39	22	23	21	27	31	118	232	223	192	136	1,181
1956	96	34	22	21	21	28	34	131	237	257	222	170	1,273
1957	123	34	23	20	16	26	30	142	242	217	244	178	1,295
1958	115	30	27	28	26	36	42	138	270	265	237	186	1,400
1959	106	40	29	23	22	29	40	172	256	282	244	190	1,433
1960	111	37	29	21	24	35	46	136	289	287	279	202	1,496
1961 1/	103	30	25	24	23	33	42	191	268	269	286	196	1,490
1962 1/	146	53	37	37	30	38	49	218	288				

1/ Preliminary.

For earlier years, see Grain and Feed Statistics, Stat. Bul. 159, June 1962, table 87 pages 76 and 77, ERS, USDA.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

Disappearance is computed from production data adjusted for changes in stocks at processing plants during the feeding year. In 1961-62 (year beginning October), total utilization was 1,503,000 tons, up 5 percent from 1960-61 and 8 percent above the 1957-61 average. Total disappearance for the current feeding year is estimated at about 1,600,000 tons or 50,000 below the estimated production level for the year.

In recent years, exports of alfalfa meal have expanded, but available information on exact amounts and countries of destination is incomplete. Foreign trade officials report that Japan received over 100,000 tons of U. S. dehydrated alfalfa meal in 1962 compared with almost none in 1955. Other reports indicate that Common Market countries imported about 75,000 tons in 1962. About 60,000 tons of this was destined for the Netherlands, considered to be the largest producer of formula feeds in the Common Market. Liberal shipments of U. S. alfalfa meal to the Netherlands are expected to continue at least through November.

Alfalfa Meal Production By Regions

Alfalfa meal is produced mostly in the West North Central and Western regions of the United States. In recent years, these 2 regions have accounted for about 80 percent of total U. S. output.

The West North Central region has produced about half of the U. S. total output in the past 6 years, of which Nebraska, the leading State, has provided about a third. Since 1957, Nebraska has accounted for about 65 percent of the total output from the West North Central region. In 1962-63 (May-April marketing year), production of alfalfa meal in Nebraska totaled 522,000 tons, about 7 percent more than in 1961-62, and 10 percent above the 1957-61 average (table 26). During May-June this year, production in Nebraska totaled 198,000 tons, compared with 161,000 in those 2 months last year. Kansas ranks second in the West North Central region and third in the U. S. in total quantity of meal output. In recent years, its production has exceeded 100,000 tons per year, or about 10 percent of the U. S. total.

About 28 percent of the total domestic production of alfalfa meal is produced in the Western region. During 1962-63, production in the Western region totaled 548,000 tons, nearly 130,000 more than the year before and 156,000 more than the 1957-61 average. California ranks second to Nebraska in volume output of U. S. meal, and is by far the leading producer in the Western region. In 1962-63, alfalfa meal production in California reached a new record of 364,000 tons, nearly 100,000 more than that produced in 1961-62. California's production of alfalfa meal in May-June totaled 80,000 tons, an increase of 15,000 over that period a year earlier. Colorado's annual production in the past 6 years has exceeded 100,000 tons and combined with California, accounted for around 90 percent of total alfalfa meal produced in the Western region. Meal production in Colorado during May-June was 20,000 tons, down nearly 50 percent from those 2 months of 1962.

Table 24.- Alfalfa meal: Total disappearance and stocks at processors' plants, by months, United States, 1950-62 1/

Year beginning October	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Total disappearance													
1950	87	78	98	88	79	97	68	84	138	152	135	114	1,218
1951	93	83	78	67	61	69	58	93	147	167	150	112	1,178
1952	100	77	68	51	73	100	52	46	141	127	101	107	1,043
1953	104	84	103	79	72	73	79	102	133	137	123	121	1,210
1954	111	89	93	90	70	81	85	135	154	161	134	121	1,324
1955	101	71	81	98	81	90	97	105	150	135	132	108	1,249
1956	114	97	80	89	72	78	71	99	123	142	133	120	1,218
1957	97	79	83	95	78	97	98	104	155	151	123	124	1,284
1958	122	100	111	130	82	84	84	94	138	170	139	125	1,379
1959	110	107	108	96	88	103	84	95	135	162	144	125	1,357
1960	106	114	113	121	104	105	100	113	147	142	139	132	1,436
1961 2/	125	123	110	131	103	111	98	103	137	162	172	128	1,503
1962 2/	140	160	128	133	110	110	90	121	151				
Stocks (beginning of month) 3/													
1950	238	263	228	167	131	98	57	24	30	68	123	162	---
1951	186	188	155	116	89	66	37	26	63	138	205	255	---
1952	294	295	254	215	193	152	87	68	106	172	232	289	---
1953	322	306	259	184	130	86	52	27	71	167	254	309	---
1954	377	378	340	282	216	172	127	89	121	229	341	429	---
1955	455	471	439	380	305	245	182	116	128	210	299	359	---
1956	387	370	307	249	180	130	80	42	73	188	303	391	---
1957	442	467	422	361	287	225	154	85	124	211	277	398	---
1958	452	445	375	291	189	133	85	43	88	221	315	412	---
1959	478	475	408	329	256	190	117	72	149	270	390	489	---
1960	554	558	483	398	297	218	148	94	116	258	403	544	---
1961 2/	614	592	499	414	308	228	149	93	180	312	418	533	---
1962 2/	600	606	499	407	310	230	158	116	213	350			

1/ Total of both sun-dried and dehydrated. 2/ Preliminary. 3/ For earlier years, see Grain and Feed Statistics, Stat. Bul., 159, ERS, USDA, June 1962, table 90, page 78.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

Table 25.- Alfalfa meal: Production, total disappearance, and percent of totals, to quarters, United States, average 1957-61, annual 1959-62 1/

Year beginning October	:	Unit	Production					Disappearance				
			Oct.-	Jan.-	Apr.-	July-	Oct.-	Oct.-	Jan.-	Apr.-	July-	Oct.-
			Dec.	Mar.	June	Sept.	Sept.	Dec.	Mar.	June	Sept.	Sept.
	:	:	:	:	:	:	:	:	:	:	:	:
Average 1957-61	:	:										
Quantity	:	1,000 tons:	173	77	461	712	1,423	322	305	337	428	1,392
Proportion of total	:	percent :	12	6	32	50	100	23	22	24	31	100
1959-60	:	:										
Quantity	:	1,000 tons:	175	74	468	716	1,433	325	287	314	431	1,357
Proportion of total	:	percent :	12	5	33	50	100	24	21	23	32	100
1960-61	:	:										
Quantity	:	1,000 tons:	177	80	471	768	1,455	333	330	360	413	1,436
Proportion of total	:	percent :	12	5	31	52	100	23	23	25	29	100
1961-62 2/	:	:										
Quantity	:	1,000 tons:	158	80	501	751	1,490	358	345	338	462	1,503
Proportion of total	:	percent :	11	5	34	50	100	24	23	22	31	100
1962-63 2/	:	:										
Quantity	:	1,000 tons:	232	105	555			428	353	362		
Proportion of total	:	percent :										
	:	:										

1/ Total of sun-dried and dehydrated. 2/ Preliminary.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

Table 26.- Alfalfa meal: Production by regions and States, year beginning May, average 1957-61, annual 1957-62 1/

Region and State	Average 1957-61	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63 2/
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
North Atlantic <u>3/</u>	33	24	34	36	35	35	33
East North Central							
Ohio	93	88	91	76	94	115	69
Michigan and Wisconsin	21	24	16	20	20	24	16
Illinois and Indiana	19	22	19	19	20	16	16
Total	133	134	126	115	134	155	101
West North Central							
Nebraska	473	436	451	493	492	490	522
Kansas	142	135	142	125	149	160	195
Missouri	46	50	46	46	46	43	39
Minnesota	24	21	19	22	22	34	39
Iowa	29	27	26	26	29	34	35
Total	716	4/685	684	712	738	761	830
South Central							
Arkansas and Tennessee	22	20	14	21	30	26	23
Oklahoma	8	10	11	7	7	6	8
Texas	25	26	27	26	24	22	21
Total	55	56	52	54	61	54	52
Western							
California	233	187	218	240	257	266	364
Colorado	116	123	118	108	114	118	144
Washington and Utah	39	5/ 31	6/ 42	44	41	35	30
Total	392	7/359	378	392	412	419	8/548
Other States	55	30	54	76	67	49	34
Total U.S.	1,384	1,288	1,328	1,385	1,447	1,473	1,598

1/ Includes total of suncured and dehydrated. 2/ Preliminary. 3/ Pennsylvania only. 4/ Total includes 16,000 tons produced in North and South Dakota. 5/ Includes small quantity produced in Idaho. 6/ Includes small quantity produced in Arizona. 7/ Includes 18,000 tons produced in Arizona and New Mexico. 8/ Includes 10,000 tons produced in New Mexico and Nevada.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

Table 27.- Alfalfa meal: Average wholesale prices at selected markets, year beginning October, average 1957-61, annual 1957-62 1/

Market	Average 1957-61	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63 2/
	Dol. per ton	Dol. per ton	Dol. per ton	Dol. per ton	Dol. per ton	Dol. per ton	Dol. per ton
Buffalo	57.50	52.95	61.80	60.40	56.25	56.20	60.80
Chicago	50.40	44.40	54.90	52.65	48.70	51.10	52.60
Kansas City	45.75	38.30	50.15	47.60	45.15	47.60	48.90
Memphis	51.90	3/49.40	58.10	54.00	47.90	50.10	52.00
California mills	53.20	49.40	53.00	54.20	55.00	54.20	55.20
Principal markets <u>4/</u>	47.70	41.30	51.20	49.50	47.50	48.80	50.20

1/ Simple averages of Tuesday quotations, with exception of principal markets which are weighted. Prices are on a basis of bulk, 17 percent protein, dehydrated meal. 2/ October-July average. 3/ Bagged alfalfa meal. 4/ Kansas City, California mills, Minneapolis and Omaha.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

Alfalfa meal production in the North Atlantic, East North Central and South Central regions has shown no consistent trend pattern in recent years. Production from these regions is relatively small when compared to the West North Central and Western regions.

Seasonality of Production

Alfalfa meal production is characterized by extreme seasonal variation as noted by the chart on page 39. This variation is due to the fact that much of the alfalfa is cut for hay or processed into meal during May-September. Production is low and fairly stable from November through April, but swings sharply upward in May until peak outputs are reached in June and July. In recent years, there have been indications that alfalfa meal production has become somewhat more seasonal in nature. The indexes of seasonal variation for 1961 show a wider range from low to high production than the average range in 1950-55 or 1956-61 (table 28). Seasonal indexes are computed from the combined production of dehydrated and suncured meal. Production of suncured alfalfa is fairly stable throughout the year having much less seasonal swing than dehydrated meal. The increasing importance of dehydrated meal in the total production has been at least partly responsible for the increase in the seasonal swing in total production. Meal produced in the winter months is primarily from suncured alfalfa and is produced largely in California and Arizona which have relatively long growing seasons.

Seasonality of Disappearance

Seasonal variation also exists in disappearance of alfalfa meal, but not to the extent of production. The seasonal pattern in disappearance is similar to production, but the degree of seasonal variation is much less. When seasonal variations of disappearance during later years were compared with those of earlier years, there was somewhat of a smoothing out effect in the latter years. This indicates less swing in the seasonal pattern at the current time. In the past 5 years, alfalfa meal disappearance in the winter months has increased while declining slightly in the spring and summer months when compared with the earlier period of 1950-55.

Volume wise, a higher quantity of meal is utilized during the summer months because of (1) larger production at the time, (2) seasonally lower prices, (3) and increased demand for use in mixed livestock and poultry feeds. Alfalfa meal processors also desire to move new meal into consumption channels as rapidly as possible to avoid storage costs and quality deterioration which occurs through prolonged periods of storage. Stocks of alfalfa meal at processing plants accumulate during periods of high production and diminish in periods of low production. About 50 percent of the total annual production occurs during July-September, while about only 30 percent of the total annual disappearance occurs in that period (table 25).

Alfalfa Meal Prices

During the past decade, average prices of alfalfa meal at Kansas City (17 percent protein, dehydrated, wholesale, bulk) for the October-September

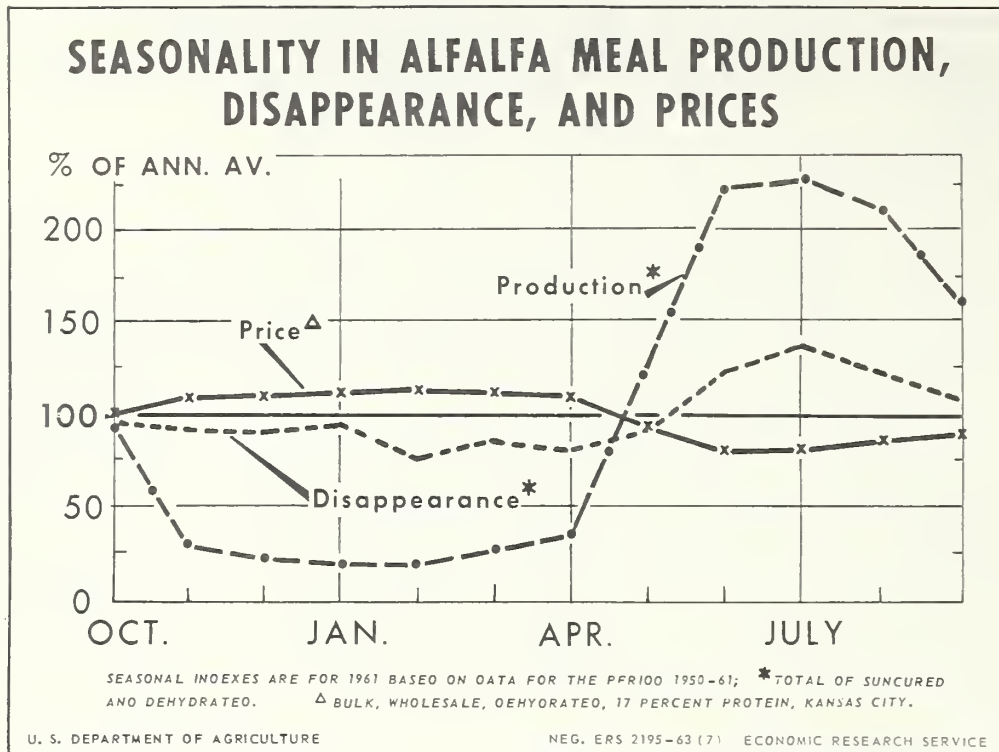


Table 28.--Alfalfa meal: Seasonal variation in production, total disappearance and prices, 1950-61 with comparisons

Year beginning October	Monthly indexes of seasonal variation ^{1/}								
	Production ^{2/}			Total disappearance ^{2/}			Prices ^{3/}		
	Average 1950-55	Average 1956-61	1961	Average 1950-55	Average 1956-61	1961	Average 1950-55	Average 1956-61	1961
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
October	103	100	95	102	99	97	104	103	101
November	41	32	30	83	88	92	107	109	109
December	30	23	23	87	88	90	114	110	109
January	29	21	20	76	93	94	122	115	112
February	31	20	19	73	74	77	122	117	114
March	39	28	27	78	83	85	113	114	112
April	40	34	34	71	80	79	110	111	110
May	115	128	125	102	95	91	80	87	93
June	216	225	223	135	129	125	72	78	81
July	217	225	229	148	138	138	81	80	82
August	186	207	213	130	122	122	85	85	87
September	153	157	162	115	111	110	90	91	90
Average	100	100	100	100	100	100	100	100	100

^{1/} The indexes are computed on the basis of monthly data for the period 1950-61, with adjustments for trend, cycles and irregularities in the data so as to reflect the "normal" seasonal variation for the 5 year periods and for 1961. ^{2/} Total of suncured and dehydrated.

^{3/} Wholesale, bulk, 17 percent protein, dehydrated, Kansas City.

Compiled from reports of the Grain Division, Agricultural Marketing Service.

feeding year, have ranged from \$38.30 to \$53.35 per ton. In recent years, strong domestic and foreign demand has kept prices at around \$45 to \$50 per ton despite increased production. During October-July 1962-63, alfalfa meal prices averaged \$48.90 per ton, or about 2 percent higher than in the corresponding period last year.

Since 1957-58 alfalfa meal prices in the West North Central region, as represented by the Kansas City market, have been lower than in other regions of the U. S. (table 27). This is probably because the West North Central region is a major source of production and has a relatively large number of processing plants. Prices at Buffalo, one of the major feed mixing centers, ranged from about \$8.50 to \$14.50 per ton higher than at Kansas City. This price differential, although narrowing somewhat in recent years, generally reflects the transportation cost from the surplus producing areas of the Midwest to Buffalo.

Prices of alfalfa meal at California milling points in recent years have averaged about \$3.00 to \$11.00 per ton higher than at Kansas City, but have been slightly lower than prices at Buffalo. Expanded domestic and export demand for alfalfa meal, coupled with higher alfalfa production costs, involving irrigation systems, is reflected in relatively higher prices paid by California meal processors for alfalfa. Much of the alfalfa meal sold in the northern half of California carries a protein content of 20 percent. This also would contribute to the slightly higher price as most meal sold in the Midwest and other marketing points is on the basis of 17 percent protein. In the past 6 years, prices at California milling points have generally trended upward from \$49.40 per ton in 1957-58 to \$54.20 during 1961-62. During October-July, prices at California mills averaged \$55.20 per ton, about the same as last year's level for that period.

Seasonality In Alfalfa Meal Prices

Like production and disappearance, prices of alfalfa meal also follow a seasonal pattern during the year. The highest prices occur in the winter months while the lowest prices occur in the summer months. The greatest seasonal price change occurs as a decline during the April-June quarter of the year. The pattern of price seasonal variation is opposite and considerably less pronounced than the seasonal variation in production (chart on page 39)--but exhibits similar swing with an opposite pattern when compared with seasonal variation in disappearance.

A review of historical seasonal price data reveals that in recent years, prices of alfalfa meal have become somewhat less seasonal, therefore, lending support to the tendency of price variations leveling-out within the marketing year. During 1956-61, prices seasonally rose 50 percent from June to February. This was somewhat less than the increase of 69 percent in 1950-55. Summer prices in recent years have averaged higher than in earlier years, while winter prices have averaged lower.
